TEXAS NATURAL RESOURCE CONSERVATION COMMISSION
MUNICIPAL SOLID WASTE LANDFILL SITE
FLEXIBLE MEMBRANE LINER EVALUATION REPORT

★★★★★ *READ THESE INSTRUCTIONS BEFORE COMPLETING THIS FORM* ★★★★★

This form is to be completed by a qualified professional experienced in geotechnical engineering and/or engineering geology who is experienced in geomembrane testing, the interpretation of these test results, and the proper methods of constructing impermeable synthetic liners that meet the requirements of the Commission's rules.

The purpose of the geomembrane evaluation requirement is to assure that ground water, as defined in the Texas Natural Resource Conservation Commission Rules (TNRCC and formerly Texas Water Commission), is protected from contamination resulting from the land disposal or storage of municipal solid waste. This synthetic liner evaluation is required to provide an opportunity for a professional, geotechnically qualified individual to inspect the trench or area and to document that the synthetic liner meets the Commission's regulatory requirements prior to filling operations.

Data and information required in this questionnaire are to provide the basis of the evaluation made by the professional of record. This report is to be supplemented with those quality-assurance/quality-control (QA/QC) tests as detailed in the permit's Soils and Liner Quality Control Plan (SLQCP) and shall be the basis of documentation of the quality control and acceptance of a constructed liner.

Flexible membrane, flexible membrane liner, FML, geomembrane liner, and synthetic liner are used interchangeably in this report form. All refer to the flexible membrane liner as described in the TNRCC rules.

Attach additional sheets as needed, and on each sheet identify the appropriate Part and Paragraph number for each reference.

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PART A. SITE IDENTIFICATION

Permittee____

Permit No.______________ Operational Classification Type_________

County____

(SUBMIT THIS REPORT TO THE COMMISSION IN TRIPLICATE)

PART B. GENERAL INFORMATION

1. What type of liner is required by the Permit and is it detailed in the Site Development Plan? (SDP) _____
_____
_____.

2. Is this part of a composite liner system as defined in Subtitle D of RCRA? _____.

3. Does the Site Development Plan require a Leachate Collection System for this liner system? _____
_____.

4. What are the dates of the most recent SLER and FMLER submittals prior to this document's submission? _____
_____.

5. Date of the current SLQCP that was used to develop this FMLER. _____. Does it follow the latest Commission guidelines? _____.

   a. Was this plan followed? _____.

   b. If not followed, why not? _____
   _____
   _____.

6. When do you estimate the Flexible Membrane Liner Evaluation Report (FMLER) for the next trench or area will be submitted? _____.

PART C. LOCATIONS AND/OR DESCRIPTION OF AREAS CURRENTLY BEING EVALUATED

1. Attach to this report a copy of the original sectorized fill layout plan showing the areas or sectors of the landfill site currently under evaluation and noting areas previously filled. If a copy of the original site plan is not available or is determined to be inaccurate, then prepare and attach an updated site layout that identifies the areas already filled, those currently receiving waste material, and the area or areas now being evaluated. The required grid system must be shown on this drawing.

2. On a sketch or drawing of the area or areas under evaluation, indicate the following:

   a. Location of the constructed soils (SLER) portion of this composite liner system;

   b. Boundary lines distinguishing the bottom and sidewall areas of the trenches or fill areas being evaluated; and

   c. Location, proper designation, and approval dates of prior liner evaluations.

d. Site drawing showing area covered by the geomembrane, seam locations, panel numbers, location of destructive tests, all repairs, and SLER/FMLER markers.

3. Present evaluation location and area of coverage:

a. Trench, sector, or area identification or number (give grid/station boundary limits of this evaluation) _____
_____
_____.

b. Excavation depth _____ft. Actual elevation of trench at: top _____ft.; bottom _____ft. Length of excavation at: top _____ft.; bottom _____ft. Width of excavation at: top _____ ft.; bottom _____ ft., and ratio of side slopes _____H:_____V.

c. Total number of square feet of geomembrane liner constructed for the floor _____$ft.^2$ and for each individual side slope: (1) _____$ft.^2$; (2) _____$ft.^2$; (3) _____$ft.^2$; (4) _____$ft.^2$ (if evaluated area has more than four sides, list all others below). _____
_____
_____.

d. Factory panels are _____ ft. wide and _____ mils thick.

PART D. INSTALLATION OF THE GEOMEMBRANE LINING

A professional engineer or geologist with geotechnical experience or a member of his or her staff qualified by training and experience shall monitor liner construction, but the final evaluation must be made by the aforementioned engineer or geologist.

Describe concisely on attached sheets the field and laboratory activities performed by yourself and/or your staff to accomplish this evaluation. Please indicate the methods used to determine testing locations, actual testing procedures, and field and laboratory methods that were followed.

1. Were all the QA/QC tests and the rate of testing performed, in conformance with the current Soils and Liner Quality Control Plan? _____
If not, please explain. _____
_____.

2. Dates synthetic liner was constructed _____
_____
_____.

3. Dates the Professional of Record (POR) actually visited the site _____
_____
_____
_____.

4. Dates that protective cover was installed _____
_____.
(Also see PART F. below.)

5. Name(s) of the POR's technician and dates on site _____
_____
_____
_____
_____.

6. Does the FML material meet the required specifications? Attach roll delivery documentation, manufacturer's certification, and conformance testing results?
_____.

7. Was each panel checked for thickness by using a micrometer? _____.

8. Were anchor trenches properly prepared? _____.

9. Were anchor trenches backfilled? _____.

10. Type(s) of field seaming used _____
_____
_____.

11. What method of placement was used for the Leachate Collection System (LCS) and protective cover for the FML?
_____
_____
_____

12. Does this liner require any ballast to overcome hydrostatic pressure? _____. If so, how much was placed? _____. (If ballast is placed, submit current ground-water elevation data to substantiate ballast thickness. Note: Ballast thickness must be based on highest seasonal water table elevation). Indicate if this information was provided in the SLER portion of a composite liner for this trench. _____
_____.

13. **Attach all field test and independent laboratory test data concerning synthetic liner construction. These data must include copies of all laboratory test work sheets. Also include as-built LCS drawings and documentation for thickness verification for LCS and protective cover.**

Part E. FLEXIBLE MEMBRANE EVALUATIONS CONDUCTED DURING THE CURRENT STUDY

Provide separate summaries for the tests listed below and show locations for destructive testing and repairs.

START-UP TESTING

NOTE: The Professional of Record (POR) or his or her engineering technician shall observe all test seam procedures and field tensile testing.

1. Were peel and shear test seams made by each seamer each day at the start-up of each seaming period and after the mid-day break, for each seaming apparatus he or she used that day? _____. Did each seamer make at least one test seam each day he or she performed seaming? _____. Attach the test results, including date and time of test seams, seamers, and seaming machines with tip temperatures.

NON-DESTRUCTIVE TESTING

2. Was continuous, non-destructive testing performed on all seams? _____.

3. Type of non-destructive testing: vacuum box _____, air pressure _____, other _____
_____
_____.

4. **Attach seaming documentation and non-destructive test results on all original seams and repairs.**

DESTRUCTIVE TESTING

5. Number of locations where destructive tests were performed _____. Total length of seaming _____ feet. Was destructive testing performed on every 500 linear feet of seam? _____. Attach destructive test results.

6. Minimum number of peel tests required to be performed by quality control laboratory _____. Number actually performed _____. (Dual track welds must be tested independently.)

7. Minimum number of shear tests required to be performed by quality control laboratory _____. Number actually performed _____.

8. Where are samples from each destructive test location archived? _____.

9. **Attach all field and laboratory destructive test results.**

PART F. LEACHATE COLLECTION SYSTEM

1. Gradient of bottom of evaluated area _____.

2. Gradient of leachate collection lines _____.

3. Do leachate collection system materials (trench backfill, leachate collection layer, collector pipes, geosynthetics) meet the required specifications? _____ _____.

4. **Attach suppliers' certifications of material and all laboratory test results of backfill and leachate collection material.**

PART G. PLANS CONCERNING FUTURE EVALUATIONS

On what date do you anticipate the FMLER for the next trench or area will be submitted? _____ _____.

If the actual date for the next FMLER (not anticipated date) exceeds six months from the date that the protective cover was completed for this FMLER as stated in PART D.1.e. above, then the additional information required below must be submitted.

Provide an "Interim Status Report" within six months completion of the protective cover and each six months thereafter until the entire liner system is covered by municipal solid waste. This report should be developed by a qualified independent consultant and submitted to the TNRCC. No formal report form exists for this purpose. The integrity and required thickness of the protective cover must be verified. If erosion of the protective cover has occurred, then it must be replaced and reported as such and verified by the consultant that it meets the thickness requirement. If repairs are necessary on the synthetic liner, then these repairs must be completed in accordance with the approved SLQCP and reported to the TNRCC in a supplemental FMLER.

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PART H. SIGNATURE OF THE PROFESSIONAL OF RECORD

AFFIX SEAL BELOW IF A PROFESSIONAL ENGINEER

(SIGNATURE)

(TYPED OR PRINTED NAME)

(TITLE)

(COMPANY OR BUSINESS NAME)

(DATE SIGNED)

(ADDRESS, CITY, ZIP CODE, ETC.)

PHONE NUMBER

FAX NUMBER

Note: A professional engineer must be registered in Texas.

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Part I. SIGNATURE OF PERMITTEE

By signing this document you are agreeing to the following regulatory requirements and policies.

1. I have read and fully understand the findings of this FMLER submittal.

2. Any trench or area not covered by a previously accepted SLER document and this FMLER or any prior accepted SLER and FMLER documents will not be used for the receipt of solid waste.

3. The trench or area covered by this FMLER document will not be used for the receipt of solid waste until written acceptance of this FMLER document is received or 14 days have elapsed **from the date of receipt of this FMLER by the Commission** and you or your designated representative have notified us by telephone of your intent of usage. In this manner you will be able to determine the date of arrival of the FMLER in question. To obtain a status report on this FMLER submittal please call 512/908-6726.

4. The acceptance of this FMLER document does not grant its usage for the receipt of solid waste without acceptance, where required, of the leachate collection system "as built" documentation.

If the landfill operator places waste after 14 days without formal authorization or has not notified the Commission of this intent and the FMLER is found to be unacceptable for any reason, the operator will then be required to remove such waste and place it in an approved area until the liner is found acceptable by the Commission.

Note: If you include your fax number along with your telephone number, we will notify you or your designated representative as soon as FMLER acceptance has been determined. Verbal and/or faxed notification will be followed by written acceptance.

_____ (SIGNATURE)

_____ (TYPED OR PRINTED NAME)

_____ (TITLE)

_____ (DATE SIGNED)

_____ (BUSINESS NAME)

_____

_____ (ADDRESS, CITY, ZIP CODE, ETC.)

PHONE NUMBER_____

FAX NUMBER_____

(PHONE NUMBER AND FAX NUMBER IF YOU WISH PRELIMINARY NOTIFICATION IN THIS FASHION)

IMPORTANT: THREE SIGNED, SEALED, AND DATED COPIES OF THIS FORM WHICH INCLUDES ONE ORIGINAL COPY AND ALL ATTACHMENTS (DRAWINGS, COMMENTS, ETC.) MUST BE PROVIDED TO THE COMMISSION.